



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/686,031	10/11/2000	Mikael Isaksson	S1022/8549	5932
7590	11/30/2004		EXAMINER CHANG, EDITH M	
James H. Morris Wolf, Greenfield & Sacks, P.C. 600 Atlantic Avenue Boston, MA 02210			ART UNIT	PAPER NUMBER
			2637	

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/686,031

Applicant(s)

ISAKSSON ET AL.

Examiner

Edith M Chang

Art Unit

2637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 2-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3-6,9-11,13-16,18-21 and 23 is/are rejected.
- 7) ☒ Claim(s) 2,7,8,12, 17, 22 and 24 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments, see pages 11-12, filed July 20, 2004, with respect to claims 2-8, 12, 17, 22 and 24 have been fully considered and are persuasive. The rejection of claims 2-8, 12, 17, and 22 has been withdrawn.
2. Applicant's arguments filed July 20, 2004 have been fully considered but they are not persuasive. The rejection of claims 9-11, 13-16 and 18-21 is upheld.
3. Regarding claims 9, 14 and 19, applicant argues that the Sands contains no disclosure of utilizing an autocorrelation function to adjust frame timing, Hardcastle and Isaksson do not provide the teachings.

Sands's system/method is for the VDSL modems with crosstalk interferences using DMT multi-carrier scheme and teaches the correlation function to frame synchronization in column 4 lines 50-55 (US patent 5,627,863 is referenced, FIG.1 & FIG.2). It is well known in the art that the energy of the frame is a measurement/representative of the autocorrelation function, further the Hardcastle details the autocorrelation function of measuring energy of the frame. Sands teaches the limitations of the claims, Hardcastle details the well known autocorrelation function for the frame energy. Hence Sands teaches the claims.

Sands teaches/suggests the DMT super frame with cyclic prefix of time-division duplexing scheme of synchronization in FIG.4, column 5 lines 36-42, and column 9 lines 4-10. The Isaksson's teaches/details the cyclic extension (the cyclic prefix) of DMT frame in the

Art Unit: 2637

NEXT environment in his reference. Using the Isaksson's teaching details the Sands' teaching/suggestion.

### ***Specification***

4. For the formality of the application under the present office practice, applicant(s) is required to replace "Claims" with "I or We Claim", "The Invention Claimed Is" (or the equivalent) before the Claims part of the specification of the instant application. See MPEP 608.01(m).

### ***Claim Objections***

5. Claim 2-18 and 24 are objected to because of the following informalities:

Claim 2, line 2: "DMT signals" is suggested changing to "the received DMT signal".

Claim 3, line 2: "cross-talk signals" is suggested changing to "cross-talk components", "the VDSL" is suggested changing to "a VDSL"; line 3: "the desired signal" as "a desired signal".

Claim 5, line 2: "talk" is suggested changing to "talk components", "the VDSL" is suggested changing to "a VDSL"; line 3: "this information" is suggested changing to "the time offset".

Claim 8, line 3: "a system" is suggested changing to "the telecommunications transmission system", and "all modems" is suggested changing to "modems".

Claim 9, line 2: "acts" is suggested changing to "the steps".

Claim 12, line 3: "act" is suggested changing to "step".

Claim 13, line 1: "act" is suggested changing to "step".

Claim 14, line 9: "crosstalk" is suggested changing to "a crosstalk".

Claim 24, line 1: "the same" is suggested changing to "a same"; line 7: "extensions" is suggested changing to "extensions in the frames", "signal" is suggested changing to "DMT signal"; line 9: "components of the received signal" is suggested changing to "cross-talk components of the DMT received signal"; line 11: "modem" is suggested changing to "modem of the pair of modems".

Claims 4, 6-7, 10-11 and 15-18 are directly or indirectly dependent on the objected claims 24, 9 and 14.

Appropriate corrections are required.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 3-6, 13, 18 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3, line 2: "the cross-talk signals" lacks antecedent basis, there is no "cross-talk signals" set in this claim or the independent claim 24.

Claim 4, it does not clearly indicate the step. The amplitude is a relative measure does not a step of a method to indicate how to perform/implement the step.

Claim 5, line 2: "the cross-talk" and line 4: "the cross-talker" lack antecedent bases.

Claim 6, line 2: "the auto-correlation peak amplitude of the cross-talk signal" lacks antecedent basis; and line 4: "the cross-talker" lacks antecedent basis.

Claim 13, line 2: "the correlation maxima" does not clearly indicate which/what maxima cited in the claim 9 wherein step c) detecting the correlation maxima of the carrier signal and the correlation maxima of a crosstalk signal in the correlation signal.

Claim 18, line 2: "the correlation maxima" does not clearly indicate which/what maxima cited in the claim 14 wherein step e) detecting the correlation maxima of the first DMT signal and the correlation maxima of the crosstalk from the second DMT signal.

Claim 23, line 3: "the correlation maxima" does not clearly indicate which/what maxima cited in the claim 19 wherein step c) detecting the correlation maxima of the carrier signal and the correlation maxima of a crosstalk signal in the correlation signal.

8. The term "relative" in claim 4 is a relative term which renders the claim indefinite. The term "relative" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. What does it mean the amplitude is a relative measure of the power, how relative is a relative measure?

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 2637

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 9-10, 13-15, 18-20, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sands et al. (US 6134283) in view of Hardcastle et al. (US 6178025 B1).

Regarding **claims 9 & 19**, except explicitly specify means and its method for applying an autocorrelation to the signal, Sands et al. discloses the apparatus and its methods. It comprises:

a) means and its method for receiving a carrier signal on the transmission channel (FIG.1B, 1102-1106 FIG.11); b) means and its method for generating a power of the signal (1122-1124 FIG.11, 502 FIG.5A); c) means and its method for detecting maxima of the carrier signal (502 FIG.5A) and maxima of a crosstalk signal (1122-1124 FIG.11, 1202 FIG.12); d) means and its method for determining a time misalignment between the carrier signal and the crosstalk signal (1122-1124 FIG.11, column 18 lines 15-25 where the crosstalk is determined in quiet periods of the frame, that is determining a time misalignment between the signal and crosstalk); and e) adjusting a frame timing of the carrier signal based on the time misalignment (1114 FIG.11, 1206 FIG.12, column 18 lines 15-25, lines 38-40, lines 55-60 where are the adjusting techniques). However Hardcastle et al. teaches using auto-correlation on the received signal (Fig.3 & Fig.4). As Sands et al. estimating the power/energy of the signal, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the Hardcastle et al.'s correlation teaching to estimate the power of the received signal to monitor the transmission of the signal in the system in a simple and cost-effective way (column 2 lines 5-10, lines 50-60, column 3 lines 29-33).

Regarding **claim 14**, except explicitly specify applying autocorrelation to the signal, Sands et al. discloses a method comprising acts of: a) using the first VDSL modem (204 FIG.2,

Art Unit: 2637

column 9 lines 45-47, column 11 lines 15-20, where each line is a modem) of a first modem pair to send a first DMT signal over a first transmission channel (204, 212-1, 214 FIG.2) in a cable (222 FIG.2); b) using the first VDSL modem (204 FIG.2, column 9 lines 45-47, column 11 lines 15-20, where each line is a modem) of a second modem pair to send a second DMT signal over a second transmission channel (204, 212-n, 218 FIG.2) in a cable (222 FIG.2) c) using the second VDSL modem (214 FIG.2) of a first modem pair to receive the first DMT signal, the first DMT signal including crosstalk from the second DMT signal (column 11 lines 20-38 where the 310 is the 204 in FIG.2 the NEXT existing); c) detecting maxima of the carrier signal (502 FIG.5A) and maxima of a crosstalk signal (1202 FIG.12); d) determining a time misalignment between the carrier signal and the crosstalk signal (column 18 lines 15-25 where the crosstalk is determined in quiet periods of the frame, that is determining a time misalignment between the signal and crosstalk); and e) adjusting a frame timing of the carrier signal based on the time misalignment (1206 FIG.12, column 18 lines 20-25, lines 38-40, lines 55-60 where are the adjusting techniques). However Hardcastle et al. teaches using auto-correlation on the received signal (Fig.3 & Fig.4). As Sands et al. estimate the power/energy of the signal, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the Hardcastle et al.'s correlation teaching to estimate the power of the received signal to monitor the transmission of the signal in the system in a simple and cost-effective way (column 2 lines 5-10, lines 50-60, column 3 lines 29-33).

Regarding **claims 13, 18, & 23**, Sands et al. does not explicitly specify the correlation, however Hardcastle et al. teaches the means and its method of amplitude of a correlation (Fig.3 & Fig.4). As Sands et al. estimate the power/energy which is related to the amplitude of the



Art Unit: 2637

signal, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the Hardcastle et al.'s correlation teaching to estimate the power of the received signal to monitor the transmission of the signal in the system in a simple and cost-effective way (column 2 lines 5-10, lines 50-60, column 3 lines 29-33).

Regarding **claims 10, 15 & 20**, Sands et al. discloses the carrier signal is part of a DMT modulated carrier signal (column 5 lines 64-67 where the carrier signal is a modulated carrier signal, column 1 lines 45-53, column 18 lines 60-65 where the signal is part of a DMT modulated signal).

11. Claims 11, 16, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sands et al. (US 6134283) in view of Hardcastle et al. (US 6178025 B1) as applied to claims 10, 15 & 20 above, and further in view of Isaksson et al. (WO 9943123).

Regarding **claims 11, 16 & 21**, further Isaksson et al. teaches cyclic extensions (Figure 4, page 3 line 20-column 4 line 5). As Sands et al. uses the quiet portion of the super frame for crosstalk (FIG.4), at the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the cyclic extension teaching by Isaksson et al. in Sands et al.'s frame where Q is the cyclic extension to help improving the suppression of side lobe, preserving the orthogonality between the received signals (page 2 lines 15-19, page 4 lines 3-4).

#### ***Allowable Subject Matter***

12. Claims 2-8 and 24 would be allowable if rewritten or amended to overcome the objection(s) and rejection(s) under 35 U.S.C. 112, 2<sup>nd</sup> paragraph, set forth in this Office action.

Art Unit: 2637

13. Claims 12, 17 and 22 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to teach or suggest, alone or in a combination, among other things, at least a method for keeping DM frames to a same frame timing as a whole, the combination of elements and features, which includes detecting correlation maxima between a received DMT signal and a delayed copy of the received DMT signal to determine the frame boundaries of cross-talk components of the received DMT signal.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M Chang whose telephone number is 571-272-3041. The examiner can normally be reached on M-F.

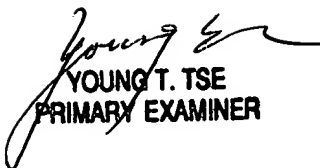
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayanti Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 09/686,031  
Art Unit: 2637

Page 10

Edith Chang  
November 21, 2004

  
YOUNG T. TSE  
PRIMARY EXAMINER